

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of

Atty. Docket

WILLEM LUBERTUS IJZERMAN ET AL.

NL 030166

Confirmation No. 1027

Serial No. 10/546,391

Group Art Unit: 2629

Filed: AUGUST 18, 2005

Examiner: NADKARNI, S.J.

Title: A PASSIVE MATRIX DISPLAY WITH BISTABLE ELECTRO-WETTING
CELLS

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United States Patent and Trademark Office
P.O. Box 1450
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APPEAL BRIEF

Sir:

Appellants herewith respectfully present a Brief on Appeal as follows, having filed a Notice of Appeal on September 29, 2008:

REAL PARTY IN INTEREST

The real party in interest in this appeal is the assignee of record Koninklijke Philips Electronics N.V., a corporation of The Netherlands having an office and a place of business at Groenewoudseweg 1, Eindhoven, Netherlands 5621 BA.

RELATED APPEALS AND INTERFERENCES

Appellants and the undersigned attorney are not aware of any other appeals or interferences which will directly affect or be directly affected by or having a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 1-14 are pending in this application. Claims 1-14 are rejected in the Final Office Action mailed in June 27, 2008. This rejection was upheld, in the Advisory Action that was mailed on November 21, 2008. Claims 1-14 are the subject of this appeal.

STATUS OF AMENDMENTS

Appellants filed on August 26, 2008 an after final amendment in response to a Final Office Action mailed June 27, 2008. The after final amendment did not include any amendments. The Advisory Action mailed on September 12, 2008, indicates that the after final amendment filed on August 26, 2008 does not place the application in condition for allowance. This Appeal Brief is in response to the Final Office Action mailed June 27, 2008, that finally rejected claims 1-14, which remain finally rejected in the Advisory Action mailed on November 21, 2008.

SUMMARY OF THE CLAIMED SUBJECT MATTER

The present invention, for example, as recited in independent claim 1, is directed to a display unit comprising at least one electro-wetting pixel 1300. As shown in FIG 13, and described on page 12, lines 14-22, each electro-wetting pixel 1300 comprises a closed cell 1303; a polar liquid 1301 and a non-polar liquid 1302. The liquids 1301, 1302 are immiscible, having different optical properties and are contained in the cell 1303.

As shown in FIG 13, and described on page 12, lines 23-32, each electro-wetting pixel 1300 comprises a counter electrode 1306; and at least one electrode pair, each electrode pair comprising an address electrode 1304 and a retain electrode 1305. As described on page 12, lines 17-19, the address and retain electrodes 1304, 1305 are separated from the liquids 1301, 1302 by a surface 1307 that is lyophobic in relation to only one of the liquids. The address and retain electrodes 1304, 1305 are arranged at respective electric potentials to control a spatial distribution of the liquids 1301, 1302 and thereby defining a multi-stable pixel state.

As described on page 12, lines 27-29, the current state is retained by applying a potential to the retain electrode 1305 in relation to the counter electrode 1306 and removing any potential from the address electrode 1304 in relation to the counter electrode 1306.

The present invention, for example, as recited in independent claim 12, is directed to a method for bistable addressing of at least one electro-wetting pixel 1300. As shown in FIG 13, and described on page 12, lines 14-32, each electro-wetting pixel 1300 comprises an address electrode, a retain electrode 1304 and a counter electrode 1305. As described on page 13, lines 1-6, an active state is set by applying a potential to the address electrode 1304 and the retain electrode 1305 in relation to the counter electrode 1306; and a passive state is set by removing any potential from the address electrode 1304 and from the retain electrode 1305 in relation to the counter electrode 1306.

As described on page 12, lines 27-29, the method further comprises retaining the current state by applying a potential to the retain electrode 1305 in relation to the counter electrode

1306, and removing any potential from the address electrode 1304 in relation to the counter electrode 1305.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-8 of U.S. Patent Application Serial No. 10/546,391 are unpatentable under 35 U.S.C. §103(a) over U.S. Patent No. 5,757,345 (Sheridon) in view of U.S. Patent No. 6,911,132 (Pamula).

Whether claims 9-11 of U.S. Patent Application Serial No. 10/546,391 are unpatentable under 35 U.S.C. §103(a) over Sheridan and Pamula in view of U.S. Patent No. 6,603,344 (Kawanami).

Whether claims 12-14 of U.S. Patent Application Serial No. 10/546,391 are unpatentable under 35 U.S.C. §103(a) over Kawanami in view of Pamula.

ARGUMENT

Claims 1-8 are said to be unpatentable over Sheridan in view of Pamula.

Appellants respectfully request the Board to address the patentability of independent claims 1 and 12, and further claims 2-11 and 13-14 as depending from independent claims 1 and 12, based on the requirements of independent claims 1 and 12. This position is provided for the specific and stated purpose of simplifying the current issues on appeal. However, Appellants herein specifically reserve the right to argue and address the patentability of claims 2-11 and 13-14 at a later date should the separately patentable subject matter of claims 2-11 and 13-14 later become an issue. Accordingly, this limitation of the subject matter presented for appeal herein, specifically limited to discussions of the patentability of independent claims 1 and 12 is not intended as a waiver of Appellants' right to argue the patentability of the further claims and claim elements at that later time.

On page 3 of the Final Office Action, the Examiner correctly noted that Sheridan does not teach or suggest "retaining a current state by applying a potential to the retain electrode in relation to the counter electrode and removing any potential from the address electrode in relation to the counter electrode," as recited in independent claim 12. Pamula is cited in an attempt to remedy the deficiencies in Sheridan.

Pamula is directed to an apparatus for manipulating droplets by electrowetting. The Pamula apparatus includes several electrodes, such as three or four electrodes, as recited on column 7, line 53 and column 8, line 28. The electrodes are sequentially activated and de-activated to move droplets, e.g., to separate or split a droplet into two droplets, merge two droplets into one, mix droplets, spread droplets, rotate them and so on.

Pamula specifically recites on column 9, lines 1-2:

The bias on the first electrode is then removed to move the droplet away from the first electrode. (Emphasis added)

Similarly, Pamula specifically recites on Column 16, lines 37-

40:

Subsequent activation of control electrode E_3 , followed by removal of the voltage potential at control electrode E_2 , causes droplet D to move onto control electrode E_3 as shown in FIG. 4C.
(Emphasis added)

Thus, any removal of a voltage potential from an electrode causes droplets to move.

In stark contrast, the present invention as recited in independent claim 1, and similarly recited in independent claim 12, amongst other patentable elements recites (illustrative emphasis provided):

wherein a current state is retained by applying a potential to the retain electrode in relation to the counter electrode and removing any potential from the address electrode in relation to the counter electrode.

Retaining a current state by removing any potential from the address electrode is nowhere taught or suggested in Sheridan, Pamula, alone or in combination. Instead of retaining a current state by removing potential from an electrode, Pamula discloses moving a droplet by removing potential from an electrode, which teaches away from retaining a current state by removing any potential from an electrode, as recited in independent claims 1 and

12.

Accordingly, it is respectfully submitted that independent claim 1 are allowable, and allowance thereof is respectfully requested. In addition, it is respectfully submitted that claims 2-8 should also be allowed at least based on their dependence from independent claim 1.

Claims 9-11 are said to be unpatentable over Sheridan and Pamula in view of Kawanami.

It is respectfully submitted that claims 9-11 should be allowed at least based on their dependence from independent claim 1.

Claims 12-14 are said to be unpatentable over Kawanami in view of Pamula.

On page 8 of the Final Office Action, the Examiner correctly noted that Kawanami do not teach or suggest "retaining a current state by applying a potential to the retain electrode in relation to the counter electrode and removing any potential from the

address electrode in relation to the counter electrode," as recited in independent claim 12. Pamula is cited in an attempt to remedy the deficiencies in Kawanami.

As discussed above in connection with independent claim 1, retaining a current state by removing any potential from the address electrode is nowhere taught or suggested in Pamula. Instead of retaining a current state by removing potential from an electrode, Pamula discloses moving a droplet by removing potential from an electrode, which teaches away from retaining a current state by removing any potential from an electrode, as recited in independent claims 12.

As Kawanami does not remedy the deficiencies in Pamula, it is respectfully submitted that independent claim 12 are allowable, and allowance thereof is respectfully requested. In addition, it is respectfully submitted that claims 13-14 should also be allowed at least based on their dependence from independent claims 12.

In addition, Appellants deny any statement, position or averment of the Examiner that is not specifically addressed by the foregoing argument and response. Any rejections and/or points of

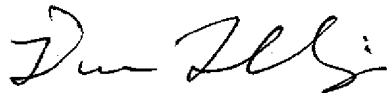
argument not addressed would appear to be moot in view of the presented remarks. However, the Appellants reserve the right to submit further arguments in support of the above stated position, should that become necessary. No arguments are waived and none of the Examiner's statements are conceded.

CONCLUSION

Claims 1-14 are patentable over Sheridan, Pamula and Kawanami.

Thus, the Examiner's rejections of claims 1-14 should be reversed.

Respectfully submitted,

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CLAIMS APPENDIX

1. (Previously Presented) A display unit comprising at least one electro-wetting pixel, each electro-wetting pixel comprising:

a closed cell;

a polar liquid and a non-polar liquid, said liquids being immiscible, having different optical properties and being contained in said cell;

a counter electrode; and

at least one electrode pair, each electrode pair comprising an address electrode and a retain electrode, said address and retain electrodes being separated from said liquids by a surface that is lyophobic in relation to only one of said liquids; and

wherein said address and retain electrodes are arranged at respective electric potentials to control a spatial distribution of said liquids and thereby defining a multi-stable pixel state, and

wherein a current state is retained by applying a potential to the retain electrode in relation to the counter electrode and

removing any potential from the address electrode in relation to the counter electrode.

2. (Previously Presented) The display unit according to claim 1, wherein said at least one electrode pair is arranged to provide one active multi-stable pixel state.

3. (Previously Presented) The display unit according to claim 1, further comprising a control unit which is operative to

apply potentials to the address and retain electrodes in relation to the counter electrode of each pixel; and to

set each pixel in either of at least one active multi-stable pixel state, by means of an address potential applied to said address and retain electrodes in relation to the counter electrode of the respective pixel, and a passive multi-stable pixel state, by means of removing any potential from the address and retain electrodes in relation to the counter electrode of the respective pixel; and to

retain a current multi-stable pixel state in each pixel by

means of applying a retain potential to each retain electrode only of the respective pixel.

4. (Previously Presented) The display unit according to claim 1, wherein the display unit comprises a plurality of pixels and wherein the pixels are arranged along rows and columns in a matrix configuration.

5. (Previously Presented) The display unit according to claim 1, wherein each pixel further comprises at least one additional electrode pair, each pair comprising a retain electrode and an address electrode, wherein the address and retain electrodes in each pixel are consecutively arranged so that the address electrodes are spatially separated from each other by retain electrodes and vice versa, and wherein each electrode pair provides for a multi-stable pixel state.

6. (Previously Presented) The display unit according to claim 5, wherein the retain electrodes within each pixel is electrically

interconnected with each other.

7. (Previously Presented) The display unit according to claim 4, wherein every retain electrode within each pixel arranged along the same row is electrically interconnected with each other.

8. (Previously Presented) The display unit according to claim 4, wherein every counter electrode within each pixel arranged along the same row is electrically interconnected with each other.

9. (Previously Presented) The display unit according to claim 1, wherein said liquids in each pixel have different indices of refraction and define a lens and wherein each pixel state is controlled by said lens.

10. (Previously Presented) The display unit according to claim 9, further comprising a light guide, and wherein said electrodes are operative to move the lens between an ON state in which the lens is operative to focus light from the light guide towards an

exit surface of the cell and an OFF state in which the lens is operative to spread light from the light guide away from the exit surface.

11.(Previously Presented) The display unit according to claim 1, wherein said liquids have different light filtering properties and wherein the spatial distribution of the liquids provides a controllable light filter which defines said pixel state.

12.(Previously Presented) A method for bistable addressing of at least one electro-wetting pixel, each pixel comprising an address electrode, a retain electrode and a counter electrode,

in which an active state is set by applying a potential to the address electrode and the retain electrode in relation to the counter electrode; and

in which a passive state is set by removing any potential from the address electrode and from the retain electrode in relation to the counter electrode; the method further comprising the step of

retaining a current state by applying a potential to the

retain electrode in relation to the counter electrode and removing any potential from the address electrode in relation to the counter electrode.

13. (Previously Presented) The method for bistable addressing according to claim 12, wherein a plurality of pixels in a display device are addressed during picture frames, the method comprising the consecutive steps of:

- setting each pixel to the active state;
- setting a subset of said pixels to the passive state; and
- retaining each pixel in the current state.

14. (Previously Presented) The method for bistable addressing according to claim 12, the pixels being arranged in a matrix having rows and columns and the pixels being addressed one row at a time.

EVIDENCE APPENDIX

None

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and Advisory Action of November 21, 2008

RELATED PROCEEDINGS APPENDIX

None